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AUTHOR Pancratz, Diane R.
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ABSTRACT

This literature review defines Fetal Alcohol Syndrome (FAS) and Fetal Alcohol Effects (FAE) and considers their causes, diagnoses, prevalence, and educational ramifications. Effects of alcohol during each of the trimesters of pregnancy are summarized. Specific diagnostic characteristics of FAS are listed: (1) growth deficiency, (2) a characteristic pattern of facial features and physical abnormalities, and (3) central nervous system dysfunction and neurobehavioral dysfunction. Various prevalence data are given, including estimates of the Centers for Disease Control that FAS may be present in 0.3-0.9 per 10,000 births, with higher rates for Native Americans, Blacks, and people of low socioeconomic status. Common behavioral problems of children affected by FAS are summarized. The common presence of academic problems in cases of FAS or FAE is noted, and the importance of and difficulties in providing early identification and intervention services are discussed. (DB)

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Fetal Alcohol Syndrome and Fetal Alcohol Effects in Child Development

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Diane R. Pancratz
University of Dubuque
Dr. Thompson
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Educators today are faced with many difficult challenges in teaching young children. One of the leading causes of mental retardation and other significant difficulties for children is totally preventable. Fetal Alcohol Syndrome and Fetal Alcohol Effects cause a large number of physical, behavioral, neurological and educational problems for children. The purpose of this research paper is to define Fetal Alcohol Syndrome, Fetal Alcohol Effects, it's causes, diagnosis, prevalence, and educational ramifications. The paper will also outline prevention measures being taken and guidelines for educators.

Fetal Alcohol Syndrome is defined as a medical diagnosis in an infant or child whose prenatal and/or postnatal growth is retarded (weight and/or length below the tenth percentile), central nervous system has neurological abnormalities, developmental delays, behavioral dysfunction, intellectual impairment and skull or brain malformations, and has a characteristic facial abnormalities (National Institute on Alcohol Abuse and Alcoholism, 1991). During the last decade, a great deal of research has been conducted on infants born to women who drank heavily during pregnancy. Results vary in many details, but the general consensus is clear: heavy drinking during pregnancy has devastating effects on the unborn fetus in a significant number of the children studied.

While not all children born to women who consumed a large quantity of alcohol prenatally have Fetal Alcohol Syndrome, many do have Fetal Alcohol Effects (FAE). The term FAE indicates that alcohol is being considered as one of the possible causes of the baby's birth defects (Gress, 1988). The term "suspected Fetal Alcohol Effects" is used when there is evidence of maternal alcohol abuse, but the three characteristics discussed in the above paragraph are not present. Although FAE is not a medical diagnosis at this time, physicians use the term to describe children with definite prenatal exposure to alcohol, but the effects are less severe (Burgess and Streissguth,

1992). Both FAE and FAS impair a child's ability to succeed in the educational setting. FAE tends to show up in more subtle cognitive-behavioral deficits.

Physical malformations are probably caused by high alcohol consumption at critical periods in the first trimester of pregnancy. During this sensitive time, heavy alcohol consumption (more than ten drinks a week or more than 46 drinks a month;"a drink" is considered equal to 12 ounces of beer, eight ounces of wine, or 1.5 ounces of hard liquor) causes infants to be smaller than 90 percent of babies in length and head circumference, according to Dr. Nancy Day, professor of Psychiatry at the University of Pittsburgh School of Medicine (Hiller, 1992).

The first three months are also critical for the development of the brain, central nervous system, and internal organ systems. Alcohol damage to the fetus during this stage can result in mental as well as growth retardation and heart damage or malformation. Damage to the central nervous system causes future problems in the area of behavior and disposition. Specific behavior problems will be discussed in detail in this paper.

During the second trimester, the fetus is vulnerable to miscarriage and stillbirth. Growth may be retarded. Eye, ear, and other facial feature defects can occur, as well as brain defects or behavioral disturbances. Details of brain defects and the effect drinking during pregnancy has on a child's learning will come later. Alcohol use can also result in limb malformation during the second trimester, because it is during these three months that limbs are formed, and alcohol prevents normal growth of these parts.

In the final trimester of pregnancy, alcohol may impair the physical development of the brain. Again, structural development of the central nervous system may result in behavioral disturbances, intellectual impairment or neurological abnormalities. Growth and maturation of the fetus is most rapid during the final three months, and alcohol damage can also result in physical malformations and general

rowth retardation.

The father's physical health can also play an important role in the overall health of their children. Scientists are finding that when a man has certain toxic substances in his body, these toxins can enter the testicles through the bloodstream and damage the sperm. This could cause miscarriage or damage the fetus at conception. A lower birth weight is another possibility, as well as birth defects or serious illnesses similar to those caused by a mother's alcohol abuse. Some of the physical problems which are caused by a father's drinking do not surface until the child is several years old. These include learning difficulties and emotional problems.

Fetal Alcohol Syndrome is a medical diagnosis. There is no biochemical or other test available to diagnose FAS, as there is with other handicapping conditions such as Down's Syndrome (Waterson and Murray-Lyon, 1990). Diagnosis is based on an evaluation of an affected individual by a physician who is specially trained to recognize these birth defects. To be diagnosed with FAS, three characteristics must be present: 1) growth deficiency--low birth weight and/or short length at birth and continuing during childhood, 2) a characteristic pattern of facial features and other physical abnormalities, and 3) central nervous system dysfunction, including microcephaly (abnormal smallness of the head) and neurobehavioral dysfunction (e.g. hyperactivity, motor problems, attention deficits, cognitive disabilities, etc.) Generally, there must also be strong evidence of maternal drinking before a physician can make a positive diagnosis (Burgess and Streissguth, 1992).

Alcohol effects are often confused with other congenital defects. One such syndrome often misdiagnosed as FAS is the Fragile X Syndrome. Both affect the learning capabilities of children as well as their social interactions (Smith, 1989). Both have only recently been diagnosed. Fragile X Syndrome is a genetic disorder, while FAS is strictly to environmental influences.

How much alcohol is too much? Many women ask this question of their doctors, and generally they will get the same reply. There is *no* safe level of consumption during any point in a pregnancy, nor is there any indication that it is safe to drink in the weeks before conception either. To be perfectly safe, neither the man or the woman should drink if there is a potential for pregnancy. Once a woman is pregnant, she should not drink at all. Physicians are obliged to tell patients that no amount of alcohol is safe. Even though many patients and doctors may feel that an occasional drink will not be harmful, this statement requires a judgment call on the part of the pregnant woman. What many may consider an occasional drink may in fact be an unsafe amount. Perhaps the way to think should be, "How will this drink benefit the baby at all?"

Some estimations have been made to correlate the amount of alcohol consumed with the degree of damage to the unborn child. It is estimated that 4 to 6 drinks daily may result in the maximum consequences of Fetal Alcohol Syndrome, 1 to 3 drinks daily will slow fetal growth and trigger Fetal Alcohol Effects, 1 to 2 drinks per week will increase risk of miscarriage or stillbirth, and an occasional binge may result in Fetal Alcohol Effects.

There is a vast amount of research and statistics regarding Fetal Alcohol Syndrome and Fetal Alcohol Effects. While it is difficult to have exact numbers, the estimations are alarming. Thirty-eight thousand babies in the U.S. are born each year with some degree of Fetal Alcohol Effects or full-blown Fetal Alcohol Syndrome(Waterson and Murray-Lyon, 1990). The Center for Disease Control estimates that FAS may be present in 0.3-0.9 per 10,000 births. This data excludes Native Americans, because the incidence in this population is much higher. Worldwide, the rate was 1.9 per 1000 live births. In sites where the mothers were black or Native American, or of low socioeconomic status, the rate was higher, 2.6 per

1000 live births. This is compared with 0.6 per 1000 where mothers were predominately white and of middle socioeconomic status (Nat'l Institute on Alcohol Abuse and Alcoholism, 1991). Other studies indicate that one in 500-600 children is born with FAS, while one in 300-350 is born with FAE(Burgess and Streissguth,1992). Conditions are not limited to any race, ethnic group or social class, though. Any woman who exposes her unborn child to alcohol takes a risk.

Research and statistics are considered to be conservative because they only reflect the children have already been identified. Often, FAS and FAE do not surface until the age of six or seven. Also, it is difficult for physicians to positively diagnose FAE and FAS because mothers who drank during pregnancy are not always honest about alcohol consumption, and more specifically, the degree of consumption. Misdiagnosis is another factor for conservative figures. But since there is no biochemical test to detect FAS, many cases may go undiagnosed.

Fetal Alcohol Syndrome has specific physical characteristics. A child born with FAS may have a face with short palpebral fissures (eye openings), a thin upper lip, and an elongated, flattened midface an philtrum (the groove in the middle of the upper lip). Other facial abnormalities may be epicanthal folds, which is a skin fold covering the inner corner of the eye (a characteristic that is normal in Asians and Native Americans), a sunken nasal bridge, a short, upturned nose, deformed ears, and a protruding forehead. Also, this children tend to have retarded growth, both prenatally and postnatally. Physical characteristics, like the mental characteristics, exist along a continuum.

It is common for the children effected by Fetal Alcohol Syndrome to share common behavioral problems. During the newborn period, children are observed having sucking difficulties, jitteriness, irritability, and sometimes seizure activity (Burd and Martsolf, 1989). The following is a list of possible behaviors. Not all children

suffering from FAS will exhibit all of the problems, and they may exhibit some to a greater or lesser degree than others. Young children with FAS tend to be sociable and talkative. It is not uncommon for these children to be very active. Distractibility is often present, which alerts caregivers of possible problems early on. Impulsivity causes these children to have difficulty in the school setting as well as in other areas of life.

As children grow older, the impulsivity they exhibited in their early years turns to restlessness. They may have poor judgment. Behaviors such as lying, stealing and inappropriate sexual behaviors also occur. Unusual, erratic sleeping patterns may be present. They need immediate reinforcement and often do not realize what the consequences of their behavior will be. FAS and FAE children do not seem to learn from their past mistakes. Social relationships are strained. These children look for relationships with younger children to feel more secure and in control. They have poor communication skills. In the adolescent, it is common to see such traits as depression, anxiety and other social difficulties. Physical aggression is noted during these age groups, also.

Neurological impairments are of great concern to physicians and educators. The physical development of the brain and of the central nervous system occurs during the third trimester. Alcohol damage during this period results in lower intelligence quotients, language development delays, memory problems and inability to problem-solve. In mothers who drank more than three drinks a day, her baby's IQ was reduced on the average by 5 points (Burgess and Streissguth, 1992). The range of intelligence quotients in children with both FAS and FAE range from 30 to 105, the average being 68, according to Burd and Martsolf (1989). Speech and language difficulties are apparent in children with FAS and FAE. They tend to have problems with syntax, semantics, and pragmatics. Language production is more severely

affected than language reception.

Academic difficulties seem to be the obvious result of the alcohol damage in the prenatal period. Children of mothers who abused alcohol while pregnant show poor academic achievement, regardless of ability. The more the mother drank, the greater the child's problems. Children with FAS and FAE are found in all types of educational programs and may fall anywhere along the range from normally skilled to severely disabled. Poor academic performance is compounded by the social and behavioral difficulties they have. These children tend to be very concrete in their thinking. Thus, they may do fairly well in the early years, until more abstract concepts are common. The greatest deficit seems to be the inability to generalize knowledge into other areas of life. Functional and adaptive living skills are low.

Educators are given the difficult task of designing appropriate programs for students who are FAS or FAE. Equally difficult is the task of adapting to these kids in a regular classroom. Burgess and Streissguth (1992) have four suggestions for educators to do to allow these children to function in as normal settings with as little support as necessary. First, early intervention is needed. School personnel can identify the children who may fall into the FAS or FAE category, and help them increase important, functional skills and decrease inappropriate behaviors. Second, target the functional skills for this population and make the skills a part of the curriculum. These skills are often called daily living skills. Third, the schools need to teach the communication skills that do not develop normally in children with FAS or FAE. This includes verbal, gestural and behavioral skills that allow us to live and participate in social environments. Finally, social skills need to be taught. FAS and FAE children do not "pick things up" naturally like most children. Learning social skills will help them get along in the world for the rest of their lives.

Behavior modification is often necessary for children with FAS/FAE. Because

they have difficulty communicating, certain behaviors may be the only way these children have of expressing themselves. The use of a structured environment may be necessary to change and control behavior. A systematic schedule that is followed very consistently and a set pattern of consequences will minimize problems and help the children into adult life. It is necessary to teach communication skills and allow children to practice using these skills so mastery is reached. It is important to plan ahead, and be proactive instead of reactive.

Fetal Alcohol Syndrome/Fetal Alcohol Effects produce children that have lifelong problems. For the children who have already been born with the handicap, they rely heavily on the education system to give them the best chance possible. For those children who have not been conceived yet, prevention is the only answer. Approximately half of the states had programs that promoted public awareness to the problem of Fetal Alcohol Syndrome and Fetal Alcohol Effects in the late 1980's(Baumeister and Hamlett, 1986). More states are studying the issue presently as more national attention falls upon it. Other states have sponsored public awareness campaigns at one time or another. Professional education activities and other professional activities have taken place in many states. There is a lack of consensus as to what public agency is responsible for this problem; whether it is the Department of Public Health, agencies dealing with alcohol and substance abuse, agencies concerned with maternal and child health, or a department of mental health/mental retardation. Most states have not attempted to accurately establish the incidence of FAS and FAE.

In conclusion, Fetal Alcohol Syndrome is one cause of mental retardation (and other difficulties) which is 100% preventable. While the responsibility ultimately lies with the pregnant woman, it is necessary for federal and state agencies to come together to educate. Prevention begins in the school system. With an alarming

number of teenage pregnancies, it is not to early to start at the junior high school level. A coordinated prevention program and evaluation of the program needs to be initiated by the federal and state governments. Unfortunately, this will not solve the problem altogether. Alcoholism is a widespread disease, and woman who are pregnant may not be able to stop. Prevention of FAS and FAE begins with the prevention of alcohol abuse.

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